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ABSTRACT

Prepared as an aid to teachers, the document contains two parts intended to help correlate instruction of industrial arts at the elementary level with the recommended curriculum content in the Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12. Pertaining to field objectives 1-4 in the guide, Industry for the Elementary Grades outlines basic objectives and suggests activities for working in the areas of communications, construction, energy, transportation, materials, processes, and services. It is emphasized that the second section, Example Elementary Unit, is intended to provide teachers with ideas, suggestions for activities, content organization, and format which could be used in the implementation of any part of the guide. The sample unit deals with home construction and includes detailed instructions for building a model house and a game intended to familiarize students with hand tools. Each of the four field objectives is supplemented by one or more terminal objectives, enabling objectives, methods which can be used, media and materials suggested and required, and methods the teacher can use to evaluate student progress. (LH)

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A Teacher Directed Learning Activity Package

Prepared as an aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education K-12

Industry for the Elementary Grades

Elementary Grades

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Pertaining to Field Objectives One Through Four

CE 004 744

"To work with the elements of industry to gain understanding of how they function in producing goods and services."

"To understand the interdependence of society and industry."

"To explore the content in which industry has developed and continues to develop."

"To explore occupational areas as a basis for selecting a career and understanding the pursuits of others."

Produced by:

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Technical and Adult Education
Both of the University of Wisconsin--Stout

To The Teacher

In addition to this package, the following activities and packages have been prepared for the Department of Public Instruction relating to Industrial Arts.

Although these packages have been written for higher grade level, you may find them appropriate for your own preparation.

These materials are available from the Department of Public Instruction and can be used in instructing the areas as they are listed in the Table of Contents on page 3.

Individualized Packages:

Overview of Industrial Education
An Introduction to Research and Development
Introduction to Production Technology
The Development of Industry
An Overview of Marketing and Distribution
Maintenance and Service
Let's Study Finance
Human Resources
Analyzing a Career
Getting to Know Materials
Power and Energy
What is Property
What is Communications
Communications Between Society and Industry
The Development of Communications
Occupations in Communications
How Does Industry Affect Industry and Society
Interviewing for a Job
The Enterprise
Introduction to a Capstone Program
Early Lumbering
Geometric and Positional Dimensioning

Problem Solving Activities:

Let's Make a Kite
Let's Make a Yo-Yo
The Electro-Magnetic Crane
Let's Make a Hand Fishing Reel
Let's Make a Wall Hanging
Designing a Mobile
Let's Build an Elevator
Let's Construct a Catapult
Let's Design a Recreational Game
Repair of a Lamp Cord and Socket
The Cleaning and Lubrication of Electric Motors
Lab Maintenance Plan Development

Course Proposals:

The Metals Industries
Automotive Curriculum
Elementary Unit

Rational

The purpose of this package is to familiarize elementary school instructors with Industrial Arts and how it can be implemented into existing elementary school curriculums.

Industry has come to occupy an ever increasing role in the social, economic and political aspects of life today. Our youth must be prepared to make more intelligent decisions regarding their roles in society in relation to industry. This can be accomplished by adding a study of the elements of industry to the humanistic and scientific elements already in the elementary program.

Table of Contents

This package is designed to correlate instruction of Industrial Arts at the elementary level with the recommended curriculum content as outlined in the Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12.

I. Information
   A. Elements of industry
   B. Technology and man

II. Communications
   A. Definition
   B. Objectives
   C. Suggested activities

III. Construction
   A. Definition
   B. Objectives
   C. Suggested activities

IV. Energy
   A. Definition
   B. Objectives
   C. Suggested activities

V. Transportation
   A. Definition
   B. Objectives
   C. Suggested activities

VI. Materials
   A. Definition
   B. Objectives
   C. Suggested activities

VII. Processes
   A. Definition
   B. Objectives
   C. Suggested activities

VIII. Services
   A. Definition
   B. Objectives
   C. Suggested activities

Information

A study of the world of work is one way to include Industrial Arts in elementary curricula. Every elementary student should become familiar with the various careers and occupations confronting them in their future. It is important that all students become aware of careers and occupations early in their education in order to make wise decisions later on. Such decisions will affect their future education. All too often the education program fails to accurately reflect the products, occupations and industries of our culture.

Technology plays a key role in our society. A basic understanding of technology is necessary to assure the possession by each individual of the basic needs by which to function in society.

Let's look at technology and how it relates to man and society.

We could generalize and state that:

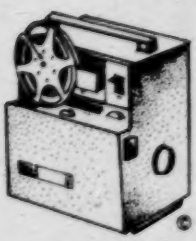
1. Man is a tool-making and tool-using animal.
2. Man has civilized himself and his environment through technology.
3. We live in an industrial technological country.
4. Technology directly affects our standard of living.
5. Technology produces change.
6. Man works to be happy, useful and successful.
7. All work has dignity.

LET'S LOOK AT COMMUNICATIONS

Communications is the interaction resulting from the exchange of ideas and information between men and/or machines.

These are some basic objectives which the student should attain in his study of communications.

1. The student will participate in an oral discussion on how television programs are broadcasted.
2. The student will participate in an oral discussion on how newspapers and magazines are published.
3. The student will participate in an oral discussion on how the telephone and telegraph function.
4. The student will list ways persons communicate without machines. (i.e., speech, sign language, expressions)
5. The student will participate in a discussion on how sound travels.
6. The student will list ways in which communications relates directly to industry.



Suggested activities to stimulate interest and create an awareness of the world of communications:

1. Have the students list ways that people communicate. Here are just a few.

Early types of communication

1. Symbols
2. Drawings
3. Language
4. Drums
5. Smoke signals

Types of communication commonly in use today.

1. Language	6. Television	11. Satellite
2. Newspapers	7. Photography	12. Light beams
3. Signs	8. Radio	13. Laser
4. Pictures	9. Telephone	14. Books
5. Drawings	10. Telegraph	15. Sign language

2. Have the student bring examples of each of the communication methods. These could be newspaper articles, pictures, drawings, or actual products or models of products. This could be an assignment for art, science, reading, or industrial arts.

3. Students relate in a class discussion how each of the above is used by people and industry.

4. Students design and mass produce a product. Students should be assigned jobs representative of industry. Sample activities include making a waxed string telephone; a class newspaper; signs to use in the classroom; setting up a radio and T.V. station; giving a short speech; reading a paragraph and explaining the meaning to the class in his or her own words.

5. Have the student write an assignment in code.

6. If you have access to a computer center, have the students visit the center and discuss the role of the computer in communications.

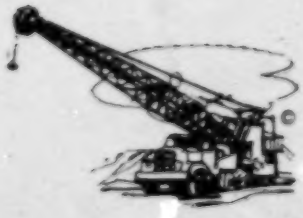
CONSTRUCTION

Construction is the combining of communication, energy, transportation, materials and processes, and services, as well as many other industrial, managerial, and finanicial elements to produce a structure to be used by man and/or animals for shelter, protection and aids in transportation.

These are some of the general objectives to be obtained in the study of construction.

1. The students will recognize why construction is important.
2. The students will describe what types of structures people build.
3. The students will discuss how buildings and structures are designed.
4. The students will describe the duties of construction workers on the job.
5. The students will list the construction elements which may be found in every building -- foundation, wall, roof, floor, ceiling, etc.
6. The students will discuss the relationship of the construction industry to the other elements of industry.
7. The students will list materials which are used in construction throughout the world.
8. The students will simulate the various types of terrains on which buildings are built.

Examples --



Bridges - over rivers - canyons - highways - bays - railways - etc.
Buildings - on farms - in cities - on hills - in valleys

9. The student will be able to discuss how buildings and structures are financed.

Suggested activities to stimulate interest and create an awareness of the world of construction:

1. Have the students play the roles of various people involved in construction.
   A. Designer
   B. Architect
   C. A person who wants to build a home.
   D. The person who owns a construction firm.
   E. The various workers
      Large machine operator (basement or foundation digger)
      Floorer
      Framer (walls)
      Plumber
      Electrician
      Roofer
      Landscaper
      Painter
      Material supplier
      Financer (banker)
      Carpets and furnishings

Other activities:

1. Draw the floor plan of their homes or school.

2. Construct a model wall section showing the various parts of a wall or building.

3. Go on a field trip to see construction in progress.

4. Invite a guest speaker from one or more of the building trades.

5. Have the students use Lincoln Logs - Tinker Toys - Errector Sets - building blocks or Tonka Toys to reproduce or produce construction as it goes on at the site.

6. Have the students build a bridge with sticks or other materials given them by the instructor. Every one's bridge may be different.

7. Have the students simulate various terrains in a sand box.

LET'S LOOK AT ENERGY

Energy may be defined as the forces needed to overcome phenomena such as cold, friction, gravity and the forces of inertia. In industry energy is used in many forms and is obtained from many sources.

These are some of the general objectives to be obtained by students in their study of energy.

1. The student will list the sources of energy common to man.

   Here is a list of possible sources he could list.

   1. Petroleum
      - Kerosene
      - Gasoline
      - Oil
      - LP gas
      - Natural gas
      - Propane
   2. Coal
   3. Wood - charcoal
   4. Sun
   5. Wind
   6. Water - electricity - water wheel
   7. Nuclear energy

2. The students should list methods used to convert material to energy.

   1. Burning - oil - gas - coal - wood
   2. Wind mills
   3. Solar heating plants
   4. Nuclear converters

3. The students should be able to recognize ways in which energy is transported from source to point of use.

   Example - Coal is dug from ground--trucked or transported by train to power plants or storage for redistribution to industry, buildings and homes. If the coal is used in the power plants to produce electricity, it is used to operate generators which produce electricity. The electricity is then sent to homes, industries, commercial buildings, farms, schools and any other place requiring electricity.

4. The student will explain ways in which energy relates to other elements of industry such as communications, transportations, materials and processes, services and construction.

Suggested activities to stimulate interest and create an awareness of the world of energy:

1. The students may list all the various sources of energy they can with assistance from the instructor, and then bring in pictures of these sources.

2. The student may visit the near by power plant to see materials or water power converted to energy as part of a field trip.

3. The students may make a model of various sources of energy such as a water wheel.

4. The students may discuss the ways in which energy relates to the other elements of industry. (See objectives, page 9).

TRANSPORTATION

Transportation, in relation to industry, may be defined as the moving of people, materials and/or products to a destination through whatever means is most appropriate and efficient.

These are some basic objectives which the student should attain in his study of industry:

1. The student will recognize at least five reasons why transportation is essential to our society and others.

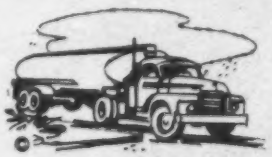
2. The student will list at least five methods of transportation used by people and industry to deliver materials--products.

3. The student will describe at least five jobs which are directly associated with the transportation industry.

4. The student will select one occupation in the transportation element of industry and list five skills this man must perform.

   Example - truck driver

   The truck driver possesses these skills:
   1. He must be an alert and skillful driver.
   2. He must be able to read well.
   3. He must be able to interpret a map.
   4. He must be able to perform basic mechanical repair and maintenance on his vehicle.
   5. He must be able to perform basic first aid.



5. The student will specify several problems occurring presently in the transportation industry.

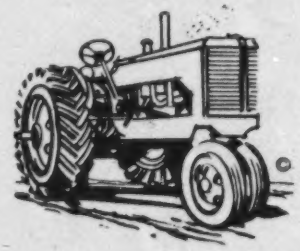
6. The student will be able to summarize the historical developments in transportation from the time of the wheel to present.

   (Note: This may be represented on a student-constructed time line).

Suggested activities to stimulate interest and create an awareness of the world of transportation:

1. The student may bring in pictures of the various types of transportation to construct a time line of transportation from the wheel on to the space flights.

2. The following may be included in the time line as picture representations.



1. Wheel
2. Wheel barrow
3. Carrying baskets
4. Walking - running
5. Horses - donkey
6. Buggy
7. Automobile
8. Taxi
9. Boats of all types
10. Trucks
11. Airplanes
12. Wheel chair
13. Tractors - wagons
14. Buses
15. Mail
16. Space ships
17. Bicycle

3. A guest speaker may be brought in from the transportation industry to talk to the students and for the students to question. This may be a traffic officer, a taxi driver, pilot or bus driver.

4. The students may want to play the roles of several types of people who are employed in the transportation element of industry.

5. The student may want to make a model of a machine used in transportation, such as model cars, buses, boats, planes, space ships.

MATERIALS AND PROCESSES

A definition of materials and processes is as follows: The element of materials and processes includes the various materials such as steel, wood, wire, plastic, leather, glass, ceramic and paper which are used in industry, and the various need to form these materials into useable items for the consumer.

These are some of the basic understandings which the student should acquire in his or her study of material and processes.

1. The student will specify where each of the materials used by industry originates. (i.e., steel from iron ore mining, lumber from timber)

2. The student will explain how industry locates the various materials used in manufacturing.

3. The student will identify several chemical and physical methods used by industry to change basic materials so that they may be transported to the factory.

4. The student will list several types of transportation used by industry to move raw materials.

5. The student will recognize several occupations involved in the extraction and transportation of raw materials.

6. The student will anlayze the various processes used by industry to change materials into finished products.

Here is a list of basic processes performed by industry. Have the students name one or several products which were made by each of the following.

cutting
gluing
milling
fastening
extruding
drawing
printing
photographing
bending
sewing
finishing
filing

grinding
turning
stamping
spraying
designing
sanding
spinning
mixing
molding
shearing
routing
heating

burning
compressing
drilling
weaving
casting
copying
screwing
injecting
welding
rolling
jointing

7. The student will evaluate several production methods. Here are three to consider:

   Mass production
   Group production
   One-man operations

8. The student will outline the elements which make up mass production.

9. The student will sub-divide the mass production process into the occupations which make up a mass production operation.

10. The student will discuss how the other elements already studied are integrated into mass production.

Activities leading the student to a basic understanding of the industrial element: materials and processes.

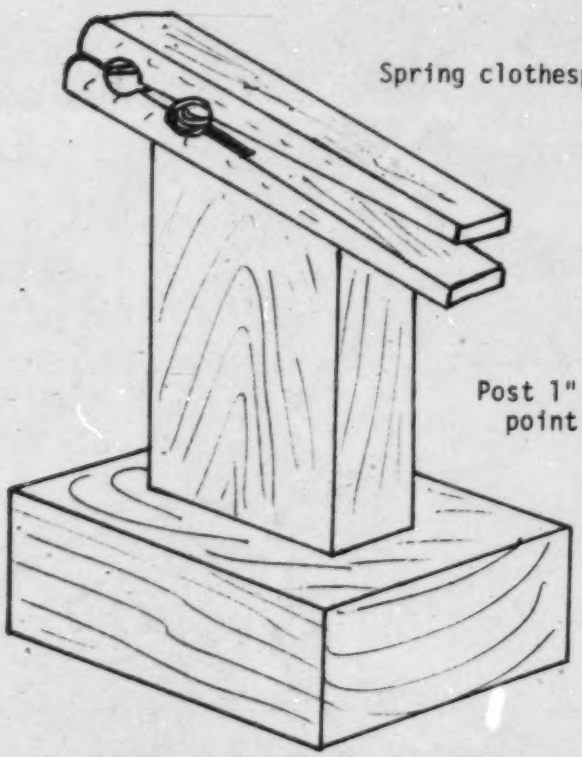
1. Have the students accumulate a list of materials used in industry.

2. The students could design a bulletin board depicting the various materials.

3. Have the students visit an industry on a field trip.

4. Have the students study the mass production process by assembling five model cars just as industry puts them together. Have the students role-play various jobs on the assembly line while putting the cars together.

If the tools and supplies are available, have the students mass produce a recipe holder as the one shown below.



LET'S LOOK AT THE SERVICE INDUSTRY

Over 40 million Americans are employed in the service-type jobs. We define services as all industries that function to maintain or service property, equipment and people.

A package is available from the Department of Public Instruction which has been written specifically on services titled Maintenance and Services.

These are some of the basic objectives which the student should reach in his study of services.

1. The student will list ten occupations related to the service industry.
2. Each student will select a job which is part of the service industry and list the competencies this occupation requires.
3. The student will describe the difference between maintenance and services.
4. The student will simulate basic tasks performed by the serviceman.

Activities which the students could do to gain an understanding of the services industry:

1. Have the students serve the classroom as a janitor or custodian would when he performs maintenance and service.

2. Have the students develop a list of occupations in the service industry by brainstorming. The list may include:

   1. Janitor
   2. Custodian
   3. Auto repairman
   4. Appliance serviceman
   5. Radio--T.V. repairman
   6. Plumber
   7. Electrician
   8. Maintenance man at factory
   9. Furnace repairman
   10. Road crews for county highway department
   11. Telephone repairman
   12. Beautician or hair stylist
   13. Construction repair
   14. Insurance man

3. Invite someone from the service industry to explain the role of a serviceman.

4. Have the students role-play a situation where one person is the customer calling the serviceman and one is the serviceman. Others may act as dispatchers, secretaries for service company, head of service company, accountant for company, and any other occupations necessary in the service industry.

Example Elementary Unit

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Lower Elementary Grades

Pertaining to Field Objectives One - Four

To work with elements of industry to gain understanding of how they function in producing goods and services.

To understand the interdependence of society and industry.

To explore the context in which industry has developed and continues to develop.

To explore occupational areas as a basis for selecting a career and understanding the pursuits of others.

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RATIONALE:

It has been recognized that the society in which we live is an industrial society. A society which fulfills its needs by consuming goods and services produced by industry.

Secondary education has offered a wide variety of industrial education programs to help the student become familiar with our industrial society. These programs range from basic activity orientated programs in the junior high school to complete vocational and technical training in the senior high school.

It seems that as far as the elementary schools are concerned, little effort has been taken to implement the concepts of industrial education into the existing curricula. Although many full scale programs have been developed for this level, they have on the most part, neglected to realize that the objectives for these programs must be directly related to the objectives of this instructional level and serve to enrich the total experiences of the elementary school student.

The objective in developing this example unit was not to teach a separate unit of instruction. Instead, the intention was to provide an example of various activities which could be developed by the classroom teacher and integrated into the existing classroom curriculum. This would provide experiences which the students could base his future study of our industrial society.

Activities:

The activities contained in this unit are only ideas. It is felt that the experienced elementary school teacher could more effectively choose or develop activities which directly relate to the needs of the individual class and to the objectives of industrial education.

Activities should be planned with consideration given to the abilities and attention span of the students concerned. Activities at this level should not be skill directed, but should at least provide an introduction to the concepts with which the students are to become familiar. Each activity should, in some way, contribute to the students identification and development of an industrially related concept. Teachers may identify concepts, from which activities will be developed, by using The Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12. Elements and content organizers are listed in the Guide for each of the stated objectives.

Objectives:

Each field objective has been divided into concepts and objectives. It was felt that this method of organizing content would provide an effective method for the teacher to design teaching strategies which would relate to the concepts being studied.

Field objectives, from The Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12, should be used to guide the development of concepts and activities which would be included in the unit. Use of these objectives includes guidance by the identified elements and content organizers for each objective.

Concepts are the basis for organization of the units. Terminal and

enabling, or behavioral objectives are used to aid the student and teacher in the development of the concepts.

A suggested format has been included to organize the concepts under study. This should provide an outline of objectives and activities that can be implemented to achieve the field objectives.

Examples of learning activities which would aid in the development of the concepts in the examples have also been included.

I CONCEPT: Houses can be built in many different sizes, shapes and colors.

Field Objective 1:
To work with elements of industry to gain understanding of how they function in producing goods and services.
Element: Research and Develop
Content Organizer: Plan and Execute

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
1. The student will recognize that there is a difference between houses and that all houses are not built alike.	A. The student will determine the number of rooms in his house, and compare this number to the number given by other students.	Outside assignment with parental help	Student's own house	Oral evaluation
	B. The student will recall what color his house is painted.	Group discussion		Oral group or individual evaluation.
	C. The students will correctly identify large or small houses, as requested, from pictures of different houses.	Group and individual work, teacher and student directed. Walk through surrounding neighborhood and discuss houses.	Magazines Pictures Films Other media plus houses that are near the school.	Observation to determine if student is discriminating between different houses.

028

II CONCEPT: Houses are built in various steps and this sequence of steps takes place over a period of time.

Field Objective 1:
To work with elements of industry to gain understanding of how they function in producing goods and services.
Element: Production
Content Organizer: Plan

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
1. Students will understand that the construction of a house takes place over a period of time.	A. The student will observe a house being constructed and check the progress of construction on that house two weeks later.	Keep a daily or weekly record of progress of a selected house or building. Have the record posted in the class. Group visitations to the construction site periodically to evaluate the progress of construction.	Paper Bulletin Board Crayons	Observation

029

II CONCEPT: Houses are built in various steps and this sequence of steps takes place over a period of time.

Field Objective 1:
To work with elements of industry to gain understanding of how they function in producing goods and services.
Element: Production
Content Organizer: Execute

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
2. The student will understand that a certain sequence is followed when constructing a house.	A. The students will determine, from their progress chart of the construction of a selected house or building, what parts of the house are built first and what parts are built last.	Observation of a house or building being constructed. Evaluation of the construction progress chart used in II-1-A	House or building near school that is being constructed. Chart used in II-1-A.	Group discussion

030

II CONCEPT: Houses are built in various steps and this sequence of steps takes place over a period of time.

Field Objective 3:
To explore the context in which industry has developed and continues to develop.
Element: Production and Materials
Content Organizer: Past and Present

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
3. The student will realize that houses in early days were not constructed in the same manner as houses of today are constructed.	A. The student will describe a house or dwelling constructed in another time period (before 1900) and tell the advantages or disadvantages of the home.	Build models of dwellings used by Indians, cavemen, etc. Lean-tos Grass shack Log cabin Igloo Soo house Tepee Discuss requirements of houses of past and present.	Materials included in the class. Clay Cardboard Wood Sticks Grass from outside, etc. Films, if available, on the homes of different people.	Observation of model and group discussion.

III CONCEPT: Many different people are involved in the construction of a house.

Field Objective 4:
To explore occupational areas as a basis for selecting a career and understanding the pursuits of others.
Element: Production
Content Organizer: Self-Awareness and Career Awareness

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
1. The student will develop an understanding that many different people are involved in the construction of a house.	A. The student will name three or more people who are involved in the construction of a house. Carpenter Plumber Block layer Contractor Planner, house planner, Designer Draftsman Architect Electrician Painter Plasterer Gardener Etc.	Expose students to these people by: Guest speaker or classroom visitor Group discussion Father or mother of a student who is involved in one of those areas.	Films, slides, pictures, field trips	Individual names two or more people involved in house construction.
	B. The student will identify any two materials with the people who would use these materials in building a house trees - gardener wood - carpenter paint - painter pipe - plumber wire - electrician	Group work, flash cards or card games Individual experiences	Materials used in other lessons. Related to media listed above	Group evaluation techniques

IV CONCEPT: Many materials are used to build the houses in which we live.

Field Objective 1:
To work with elements of industry to gain understanding of how they function in producing goods and services.
Element: Materials
Content Organizer: Sources and Kinds

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
1. The student will develop the understanding that many different materials are used to build the houses in which we live.	A. The student will identify the different materials used to construct the school or classroom that he attends.	Teacher will discuss and point out different materials in the classroom; wood, metal, glass, cloth, plastic, carpet, paint, pipe, trees, plaster, block, brick, etc.	Classroom School Other buildings	Observation by teacher.
	B. The student will identify the different materials used to construct the house he lives in.	Student will try to identify those materials discovered in class with those which are contained in his home.	Students home	Group discussion oral evaluation of students assignment.
	C. The student will recognize different materials by their weight, texture, color, and strength.	Teacher will provide a multitude of samples of materials used in the building of a house. Encourage use of these materials during play period. Discussion of differences of materials provided.	Samples of: wood, insulation, carpet, plastic, metal, cloth, brick, sand, paper, etc.	Recall, using oral group evaluation, observation.

033

V CONCEPT: Many different tools are used by workpeople when building a house.

Field Objective 1:
To work with elements of industry to gain understanding of how they function in producing goods and services.
Element: Production
Content Organizer: Execute

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
1. The student will realize that many different tools are used to construct a house.	A. Identify some of the tools used in constructing a house.	Have students play card game. Visit a construction site.	Card game, film, actual tools.	Observation group and individual discussion.

034

V CONCEPT: Many different tools are used by workpeople when building a house.

Field Objective 3:
To explore the context in which industry has developed and continues to develop.
Element: Production
Content Organizer: Past and Present

TERMINAL OBJECTIVE	ENABLING OBJECTIVE	METHODS	MEDIA & MATERIALS	EVALUATION
2. The student will realize that many modern tools were not available to early builders of dwellings.	A. The student will recall tools which were not used to build early dwellings. (Power saw, or electrical tools of any kind)	Have students construct simple tools such as hammers, pounding sticks, scrapers, etc. Make from rocks, branches or other materials available to early people of the world.	Rocks Sticks Branches Film on tools of early civilization	Observation of group work in making a tool and group discussion.

035

ACTIVITY: CONTINUING GROUP OBSERVATION
CONCEPT: II
OBJECTIVE: 1

On the following page is an example of an observation progress chart which could be enlarged and posted in the classroom.

A periodic observation of a house or building which is being constructed is necessary to complete the chart. This chart may be filled out over the same period of time in which the building is being constructed. Observation may be made by the instructor. He should report the observations to the class and have the students record the findings. An alternate method would be to have one or two students do the observation. If construction was taking place near the school, the class as a whole, could visit the construction site periodically.

Through this activity the students will realize that houses or buildings are not constructed in one day (like the models they constructed), but are constructed over a period of time which is usually several months. The students will also understand, by discussing the progress of the construction, that buildings are built in a definite sequence.

Escavation
Foundation
Frame
Roof
Outside Walls
Inside Walls
Flooring or Carpet
Painting
Landscaping
Mid-May
May
Mid-Apr
Apr
Mid-Mar
Mar
Mid-Feb
Feb
Mid-Jan
Jan
Mid-Dec
Dec
Mid-Nov
Nov
Mid-Oct
Oct
Mid-Sept

ACTIVITY: MODEL DWELLING CONSTRUCTION
CONCEPT: II
OBJECTIVE: 3

Concept: Houses are built in specific steps and this sequence of steps takes place over a period of time.

Objective: The student will realize that houses in early days were not constructed in the same manner as houses of today are constructed.

Rationale: Students must acquire a basic knowledge of how our society has developed before they can fully understand and appreciate the modern society in which they now live.

Students participating in this construction activity will have the opportunity to use samples of building materials to construct a model house. Although the idea of this activity is for the student to construct a model of an early dwelling, little, if any, emphasis should be placed upon perfection or skill in construction of the model.

By using as many of the various materials as possible in the construction of the model, the student will develop a realization that:

1. Materials used to build a house have different qualities, (color, strength, weight, texture, etc.).

2. Houses or dwellings are constructed in specific steps, (roofs cannot be added until the sides have been erected).

3. The construction of a house takes place over a period of time.

4. Houses of early days differ from the houses in which we now live.

Materials: Materials used for this activity may be secured for a minimal financial investment. In fact, many of the materials are considered as waste by industry and are available by contacting a contractor or visiting a construction site. Other materials, such as glue and tempera paint may already be available in the school supplies.

Material List (for about 5 students)

4 oz. white polyvinal glue (Elmers glue)
5 pieces 11" x 17" cardboard
Powdered or liquid tempera paint (various colors)
3 or 4 paper or styrofoam cups
1 cup pea gravel
Scrap styrofoam pieces - different colors, sizes, textures
Scrap wood pieces - different sizes
Plastic pipe - scrap pieces of plastic PVC pipe in various sizes

Pieces of cardboard - tubes or sheets
Nails - small used or new
Any short pieces of electrical wire
Asphalt Shingles
Any other materials available

All materials should be cut into small irregular pieces with none bigger than about 4 or 5 inches. Try to stay away from fiberglass as particles emitted from this material tend to irritate the skin and cause itching.

Procedure: The following steps have been listed and illustrated to guide the instructor in preparing for this activity.

Step 1

The various materials must first be procured and cut to smaller sizes. Figure 1 shows pieces of three different types of styrofoam, pea gravel, wood pieces, cardboard and sand. Plastic pipe, wire and any other materials should also be cut to a smaller size.

FIGURE 1

Those materials are usually free for the asking.

Paper or styrofoam cups are used to contain glue, pea gravel or other similar materials.

Step 2

About an inch of glue is poured into the cups, (Figure 2 and 3) and various colors of tempera paint are mixed with the glue.

FIGURE 2

These materials may already be contained in your classroom.

The glue is used as the bonding agent to hold the materials together during construction of the dwelling. The glue will stick to almost any material and may be used for wood, styrofoam, cardboard, and plastic. By allowing the glue to set for 5-10 minutes before the activity starts, setting time of the glue can be reduced. This would make the assembling of the dwelling much easier for the students.

Naturally, as shown by figures 4 and 5, the dwelling must be assembled from the bottom to the top. Although this process is the same in construction of all of the models, each model produced by the students will differ in some aspect.

Liquid or powdered tempera may be added to the glue to produce colors.

FIGURE 3

FIGURE 4

Glue bonds styrofoam, wood, plastic, pea gravel and cardboard.

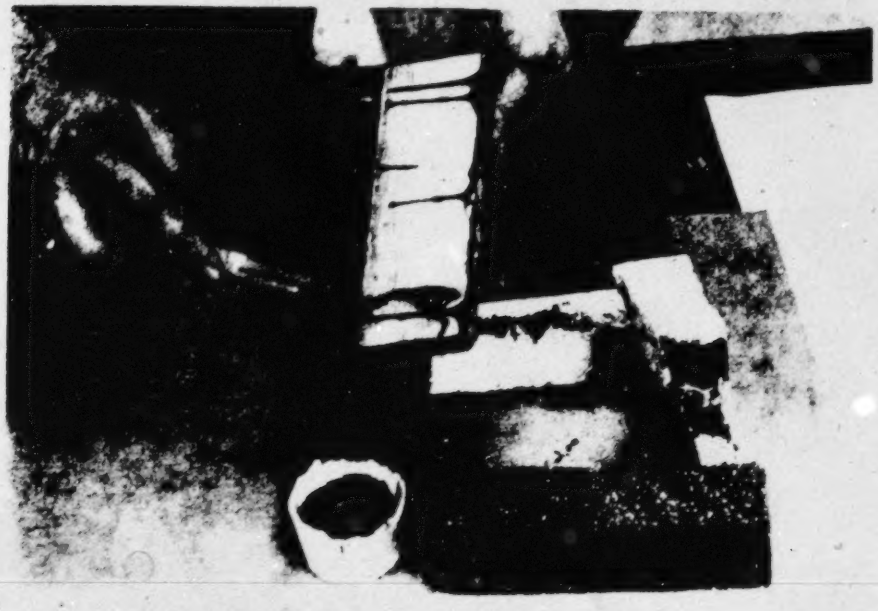

FIGURE 5

Are things constructed in a specific order?

Step 4

To keep the glue from accidently getting on the table and to provide a base for the model, have the students build directly on the 11" x 17" piece of cardboard (Figure 6). Students should feel free to be as creative as they wish when constructing their models.

FIGURE 6

Model of a lean-to built on cardboard base to facilitate handling and to keep the glue off desk tops or floors.

Step 5

Finished product is left to dry overnight (Figure 7). Activity may end at this point with a discussion or models can be used to create a replica of a town or city (a village of the past or the town or city you now live in), a housing tract, apartments or any other ideas you have.

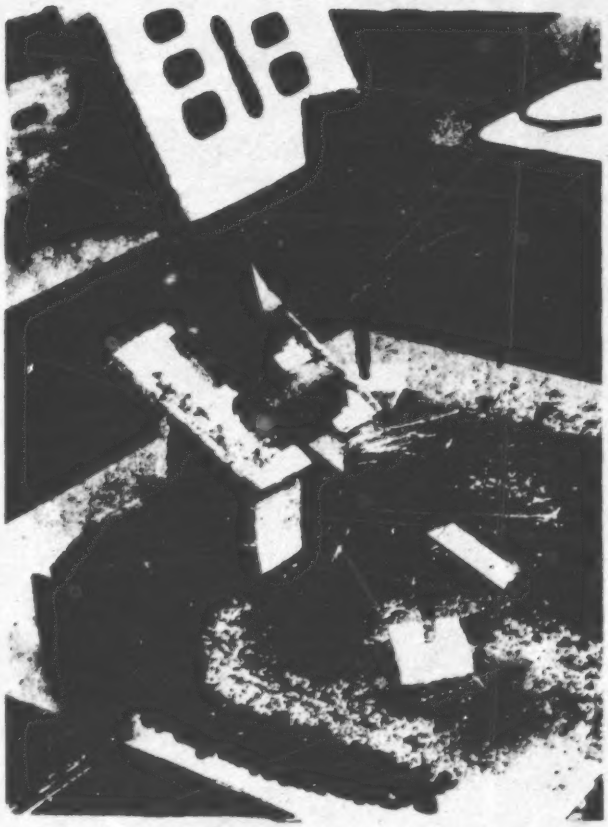

FIGURE 7

The finished product! As many different designs as there are students.

Discussion:

The activity should be ended with a discussion designed to elicit ideas from the students. Sample ideas and questions are listed.

1. Which materials are stronger?
2. How many people could live in this dwelling if it was full size?
3. Would a full size dwelling of today be built out of the same basic materials as the models?
4. Would we be able to build the roof of the dwelling before erecting the sides? Why?
5. What items are used by industry to bond or assemble the parts of the homes in which we now live.
6. How long would it take to build a dwelling for a family of 4 people today? How long 100 years ago?
7. Who builds dwellings or homes today? Who built them 100 years ago? 500 years ago?
8. How do apartments differ from our models of single family dwellings?
9. Would a grass shack or lean-to be a good dwelling for a family who lived in Alaska? Why?

ACTIVITY: CARD GAME
CONCEPT: V
OBJECTIVE: 1

The industries of our society produce a multitude of items for our consumation. The tools and equipment needed to produce the products we use may differ as much as the products themselves.

Although many speciality tools are used in every trade of industry, many tools are common to all trades. Some of these basic tools used to produce the quality goods we consume may also be found in our own homes.

At the elementary level an introduction to the basic tools of industry would provide a foundation for understanding how products are shaped, formed, assembled, and finished into the items we use in our everyday lives.

One method of providing an introduction to a unit on construction, manufacturing or any other related area would be to involve the students in simple activities related to the concept. These activities should be based upon the concept which you feel the students should understand.

An example of such an activity would be a card game being based on the simple tools the students will be using in their future lives.

The cards may be dittoed or off-set to produce the required number of sets. The cards contain pictures, names, and uses of some of the basic tools. The game itself is played much like Old Maid, with the objective being to obtain the greatest number of matching cards. The number of participants needed to effectively play the game would be from two to eight students.

All cards would be divided among the players equally. This may be accomplished by one of two methods. The players may elect to deal the cards or have each player, by rotating turns, select a card from the pile which has been spread out, face down, on a flat surfact. To start the game each player would discard onto the center of the playing surface, a card which does not match with any of the others in his hand.

Starting with the first player and moving in a clockwise manner, each player is allowed to pick-up any card on the playing surface (all are face down) and then discard any other card in his hand. The object is to match all the cards in ones hand either in pairs or combinations of pairs (three or four of a kind). An example of a hand needed to win the game would be; two drill cards, four file cards, and three screwdriver cards.

Many different variations of this game may be developed by the teacher. Any variation of the tool card game would provide for the student of the lower elementary grade an opportunity to:

1. Develop an awareness of the basic tools used by industry in producing goods and services.

2. Develop the ability to identify basic tools which the student would come in contact with in his home.

3. Develop a new vocabulary of names of tools that the student will come in contact with sometime in his life.

4. Increase his interest in mechanical items used by industry.

5. Develop an understanding of how products are assembled, formed, and shaped.

6. Further develop manipulative skills.

An example of the playing card layout is included in this package to serve as a guideline in developing a set of cards. If desired, the example set may also be used.

Many other uses of this activity may be incorporated into the playing card format. Innovative instructors may choose to substitute the tool concept with historical events of industry, functions of industry, materials used by industry, or produce a game in which the players match a product with an identified industry. Variations of this activity which could be developed by the instructor are not easily exhaustible.

Meaningful activities are not easily developed, and implementation of these activities into an existing curriculum can be extremely difficult. Although this is realized as being time consuming, it is still the responsibility of the instructor to develop and implement meaningful activities into his program which will help the individual to develop an understanding of our industrial society.

PLIERS

PLIERS

PLIERS

PLIERS

PLIERS

PLIERS

PLIERS

HOLDING

PLIERS

HOLDING

HAMMER

HAMMER

HAMMER

HAMMER

HAMMER

HAMMER

HAMMER

STRIKING

HAMMER

STRIKING

SAWS

SAWS

SAWS

VISE

VISE

VISES

VISE

VISE

VISE

VISE

HOLDING

VISE

BRUSHES

BRUSHES

BRUSHES

BRUSHES

BRUSHES

BRUSHES

BRUSHES

FINISHING

BRUSHES

SCREWDRIVER

SCREWDRIVER

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LAYOUT

CLAMPS

CLAMPS

CLAMPS

CLAMPS

HOLDING

INDUSTRY	INDUSTRY	INDUSTRY	INDUSTRY
SOCIETY	SOCIETY	SOCIETY	SOCIETY
DEVELOPMENT	DEVELOPMENT	DEVELOPMENT	DEVELOPMENT
CAREERS	CAREERS	CAREERS	CAREERS
OCCUPATIONS	OCCUPATIONS	OCCUPATIONS	OCCUPATIONS
SOCIETY	SOCIETY	SOCIETY	SOCIETY
INDUSTRY	INDUSTRY	INDUSTRY	INDUSTRY
UNDERSTANDING	UNDERSTANDING	UNDERSTANDING	UNDERSTANDING
UNDERSTANDING	UNDERSTANDING	UNDERSTANDING	UNDERSTANDING
INDUSTRY	INDUSTRY	INDUSTRY	INDUSTRY
SOCIETY	SOCIETY	SOCIETY	SOCIETY
DEVELOPMENT	DEVELOPMENT	DEVELOPMENT	DEVELOPMENT
CAREERS	CAREERS	CAREERS	CAREERS
OCCUPATIONS	OCCUPATIONS	OCCUPATIONS	OCCUPATIONS
SOCIETY	SOCIETY	SOCIETY	SOCIETY
INDUSTRY	INDUSTRY	INDUSTRY	INDUSTRY
UNDERSTANDING	UNDERSTANDING	UNDERSTANDING	UNDERSTANDING